

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of claims:

1. (Currently Amended) A continuous process for the manufacture of methylmercaptan comprising contacting in a reaction reactor an intimate mixture of carbon oxides, sulfur or hydrogen sulfide and hydrogen as reactants at elevated temperature and pressure over a preformed solid catalyst comprising an active component of Mo-O-K-based species, an active promoter which is a mixture of oxides or sulfides or sulfides and oxides of an element M wherein M is selected from the group consisting of molybdenum iron, cobalt, nickel, lanthanum, cerium and manganese, and the oxides have the formula M_xO_y where x and y are integers from 1 to 5 and, optionally, a carrier.
2. (Original) Process according to claim 1, wherein the active component is a Mo-O-K-based species, its precursor are oxides of molybdenum.
3. (Original) Process according to claim 2, wherein the active component is a potassium molybdate or ammonium heptamolybdate $(NH_4)_6Mo_7O_{24}$ plus a potassium salt or molybdenum oxide plus a potassium salt.
4. (Currently Amended) Process according to claim 3, wherein the weight ratio of K_2MoO_4 /carrier is [[of]] from 0.01-0.80/1, when the active component is expressed by the amount of K_2MoO_4 ; or the weight ratio of MoO_3/K_2O /carrier is 0.01-0.80/0.01-0.50/1, when the active component is expressed by the amount of MoO_3 and K_2O .
5. (Previously Presented) Process according to claim 1, wherein the active component of the catalyst is impregnated or coated onto the carrier by multi-step impregnation applied to the surface of the support or coating of the support with the active component.

6. (Currently Amended) Process according to claim 1, wherein the active preformed solid catalyst mass is extruded or pelletized to form three dimensional catalyst particles.
7. (Previously Presented) Process according to Claim 1, wherein an unreacted gas containing said intimate mixture is recycled to a feed gas stream in the process.
8. (Previously Presented) Process according to claim 7, wherein the gas to be recycled is separated from all by-products which are liquid at 0-5°C and ambient pressure, and wherein the recycled gas is catalytically converted so as to only consist of carbon oxides, hydrogen and hydrogen sulfide.
9. (Currently Amended) Process according to claim 1, wherein [[the]] selectivity of each of by-products methane, dimethylsulfide and carbon bisulfide is not higher than 1%.
10. (Currently Amended) Process according to claim 1, wherein [[the]] total selectivity of methylmercaptan can be increased by decreasing [[the]] total gas hourly space velocity to less than 10.000 h^{-1} 10,000 per hour, and/or by simultaneously increasing the reaction temperature to temperatures up to 500°C.
11. (Original) Process according to Claim 10, wherein the total gas hourly space velocity is decreased so as to be within the range of 100 h^{-1} to 5000 h^{-1} , and/or the reaction temperature is simultaneously increased to temperatures from 250 to 400°C.
12. (Currently Amended) Process according to claim 1, wherein [[the]] total selectivity of methylmercaptan is increased by at least 1,5%, 1.5% by decreasing [[the]] total gas hourly space velocity by 75%.
13. (Original) Process according to claim 1, wherein the carrier is silica.
- 14.-15. (Cancelled)
16. (Currently Amended) Process according to claim [[14]] 1, wherein the weight ratio of the contents in the catalyst K_2MoO_4/M_xO_y /carrier equals has a weight ratio of contents equal to

0.01-0.80/0.01-0.10/1, when the amount active component is expressed by $M_xO_yK_2M_oO_4$; or the weight ratio of the contents in the catalyst $MoO_3/K_2O/M_xO_y$ /carrier equals has a weight ratio of contents equal to 0.10-0.50/0.10-0.30/0.01-0.10/1, wherein M is selected from the group consisting of transition metal oxides and rare earth metal oxides, and x and y are integers from 1 to 5 when the active component is expressed by MoO_3 and K_2O .

17. (Cancelled)

18. (Currently Amended) Process according to claim [[3]] 1, wherein the active components are metal sulfides promoter is a sulfide, produced by sulfurizing with hydrogen sulfide prior to the reaction.

19. (Currently Amended) The process according to claim 1, wherein the potassium component in the Mo-O-K has a potassium component which is derived from the group consisting of potassium acetate, potassium oxalate, potassium hydroxide, potassium carbonate, potassium nitrate, and potassium bicarbonate.

20. (Currently Amended) Process according to claim 1, wherein the catalyst is prepared by multi-step impregnation when K_2MoO_4 , MoO_3 or $(NH_4)_6Mo_7O_{24}$ $(NH_4)_6Mo_7O_{24}$ plus a potassium salt is employed as precursor of the active component.

21. (Original) Process according to claim 20, wherein impregnation is performed by using potassium salts selected from the group consisting of potassium acetate, potassium oxalate, potassium hydroxide, potassium carbonate, potassium nitrate, and potassium bicarbonate, and oxides or sulfides selected from the group consisting of molybdenum, iron, cobalt, nickel, lanthanum, cerium and manganese.

22. (Currently Amended) Process according to claim 1, wherein the elevated temperature is at least 250°C, total pressure is at least 2 bar, [[the]] total gas hourly space velocity ranges from 100 – 5000 h^{-1} and reactants are at a temperature of at least 120°C when fed to the reactor.

23. (Currently Amended) Process according to claim 1, wherein the temperature is of from 300-450°C, the pressure is at least 4 bar and [[the]] total gas hourly space velocity is 750-3000 h⁻¹.

24. (Previously Presented) Process according to claim 1, wherein reactants, carbon oxide, sulfur and or hydrogen sulfide and hydrogen are fed to reactor, respectively, at a proportion of 1/0/1/0 to 1/10/10/10.

25. (Original) The process of claim 6, wherein the reaction is carried out in a fixed catalyst bed arrangement or in a fluidized bed to aid in reactor temperature control of the exothermic reaction.

26. (Currently Amended) Process according to claim 1, wherein a series of fixed catalyst beds or a reactor comprising one or multiple (n = 1 – 10) reaction zones is used for the chemical reaction, in which one or more of the reacting gases reactants can be fed between the reaction zones.

27. (Original) Process according to claim 1, wherein the catalyst may be arranged in fixed beds with intermediate gas injection or multitubular reactors for a better temperature control.

28. (Currently Amended) Process according to claim 26, wherein hydrogen, hydrogen sulfide, synthesis gas, and/or carbon oxides are fed to the reaction mixture between the reaction zones.

29. (Cancelled)

30. (Currently Amended) Process according to claim [[29]] 7, wherein the recycling unreacted gas is directed over a catalyst bed for the conversion of by-products before being recycled to the feed gas stream.

31. (Currently Amended) Process according to claim 30, wherein the main by-products are carbonyl sulfide, carbon disulfide, and/or dimethylsulfide.

32. (Original) Process according to claim 30, wherein by-products are catalytically converted to carbon dioxide, methylmercaptan and hydrogen sulfide before recycling them to the feed gas stream.

33. (Withdrawn) A process for preparing a solid, preformed catalyst system comprising the steps of

I) preparing an impregnation liquid of an aqueous solution of a salt of a transition metal or rare-earth metal and a precursor of K_2MoO_4 or $(NH_4)_6Mo_7O_{24}$ plus a potassium salt or MoO_3 plus a potassium salt; and

II) impregnating a suitable carrier with such impregnation liquid, followed by drying the intermediate produced, and calcinating such intermediate to obtain the catalyst.

34. (Withdrawn) A process for preparing a solid, preformed catalyst system comprising the steps of

A) preparing an impregnation liquid of an aqueous solution of a salt of a transition metal or rare-earth metal;

B) impregnating a suitable carrier with such impregnation liquid, followed by drying the intermediate produced, optionally calcinating such intermediate;

C) preparing an aqueous steeping solution of a precursor of K_2MoO_4 or $(NH_4)_6Mo_7O_{24}$ plus a potassium salt or MoO_3 plus a potassium salt; and

D) steeping the intermediate produced in (B) with the aqueous steeping solution produced in (C) and then drying and calcinating the resultant catalyst.

35. (Withdrawn) Process according to claim 33, wherein the impregnation liquid and/or the steeping solution is treated with alkyl amides, or an organic acid containing at least one carbon atom and at least one acid function.

36. (Withdrawn) Process according to claim 35, wherein the alkyl amide is dimethylformamide or dimethyl acetamide, and the organic acid is formic acid, acetic acid, propionic acid, butyric acid, pentanoic acid, hexanoic acid, acrylic acid, propionic acid, vinylacetic acid, methacrylic acid, crotonic acid, 4-pentenoic acid, sorbonic acid, oxalic acid, malonic acid, succinic acid, maleic acid, 3-hydroxybutyric acid, glutaric acid, adipic acid, citric acid, tartaric acid or ethylene diamine-tetracetic acid.

37. (Withdrawn) Process according to claim 35, wherein the organic acid is citric acid.

38. (Withdrawn) Process according to claim 34, wherein the impregnation liquid and/or the steeping solution is treated with alkyl amides, or an organic acid containing at least one carbon atom and at least one acid function.

39. (Withdrawn) Process according to claim 34, wherein the alkyl amide is dimethylformamide or dimethyl acetamide, and the organic acid is formic acid, acetic acid, propionic acid, butyric acid, pentanoic acid, hexanoic acid, acrylic acid, propionic acid, vinylacetic acid, methacrylic acid, crotonic acid, 4-pentenoic acid, sorbonic acid, oxalic acid, malonic acid, succinic acid, maleic acid, 3-hydroxybutyric acid, glutaric acid, adipic acid, citric acid, tartaric acid or ethylene diamine-tetracetic acid.

40. (Withdrawn) Process according to claim 36, wherein the organic acid is citric acid.